TLA5000B Series Logic Analyzers

▶ TLA5201B • TLA5202B • TLA5203B • TLA5204B

Features & Benefits

500 ps (2 GHz)/32 Mb Timing Record Length to Capture Intermittent Events Over a Wide Time Window

125 ps-resolution MagniVu™ Acquisition Simultaneous with Timing or State Acquisition to Find Elusive Timing Problems Quickly, Without Double Probing

Glitch and Setup/Hold Violation Triggering and Display to Find and Display Elusive Hardware Problems

Drag-and-Drop Triggers Simplify the Task of Isolating Problems and Data of Interest

235 MHz State Acquisition Provides Analysis of High-speed Synchronous Digital Circuits

iView™ Time-correlated Digital-analog View to Clearly See How Analog Anomalies Are Affecting Your Digital Signals

Microsoft Windows XP Professional PC Controller Provides Familiar User Interface with Network Connectivity

Automated Measurements Ensure Faster Setup and Analysis for Common Tasks in Drag-and-Drop Categories such as Time, Count, Minimum/Maximum and Jitter

Applications

Digital Hardware Verification and Debug

Monitoring and Measurement of Digital Hardware Performance

Embedded Software Integration, Debug and Verification

Single Microprocessor or Bus Debug

Broad Range of FPGA Supports

TLA5000B Series Logic Analyzers Combine Debug Power with Simplicity and Affordability

The affordable TLA5000B Series logic analyzers make high-speed timing resolution, fast state acquisition, long record length and sophisticated triggering available to any digital designer who needs to identify initialization failures, operation crashes and intermittent operation. For first-time as well as experienced logic analyzer users, the TLA5000B Series is ideal for single-bus timing and state analysis. An intuitive user interface, familiar Windows-based desktop and OpenChoice® networking and analysis features make the TLA5000B Series logic analyzers easy to network into your design environment.

500 ps timing resolution and 128 Mb record length with simultaneous 125 ps MagniVu timing resolution within each acquisition means you can measure digital signal timing on increasingly faster signals with confidence. With MagniVu timing resolution, find difficult problems such as digital logic errors, glitches, set-up/hold violations, and crosstalk quickly. Use setup/hold violation triggering and display to validate setup/hold performance of digital devices.

Today, most designs can have both digital and analog anomalies. With iView time-correlated digital-analog view, you'll clearly see how analog anomalies are affecting your digital signals – right on your logic analyzer display.

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▸Characteristics

General

Number of Channels –
(All channels are acquired including clocks.)
TLA5201B: 34 channels (2 are clock channels).
TLA5202B: 68 channels (4 are clock channels).
TLA5203B: 102 channels (4 are clock and 2 are qualifier channels).
TLA5204B: 136 channels (4 are clock and 4 are qualifier channels).
Time Stamp –
51-Bits at 125 ps resolution (3.25 days duration).
Clocking/Acquisition Modes –
Internal, internal 2X, internal 4X, external, external 2X, source synchronous. 125 ps (8 GHz) MagniVu™ high-speed timing is available simultaneous with all modes.

Input Characteristics (with P64xx probes)

Capacitive Loading –
<0.7 pF typical data/clock (P6419).
1.4 pF typical data; 2 pF typical clock (P6418).
2 pF typical data/clock (P6417, P6434).
Threshold Selection Range –
From –2.0 V to +4.5 V in 5 mV increments.
Threshold presets include TTL (1.5 V), CMOS (1.65 V), ECL (–1.3 V), PECL (3.7 V), LVPECL (2.0 V), LVCMOS 1.5 V (0.75 V), LVCMOS 1.8 V (0.9 V), LVCMOS 2.5 V (1.25 V), LVCMOS 3.3 V (1.65 V), LVDS (0 V) and user-defined.
Threshold Selection Channel Granularity –
Separate selection for each of the clock/qualifier channels and one per group of 16 data channels.
Threshold Accuracy (including probe) – ±(100 mV).
Input Voltage Range –
Operating: –2.5 V to 5.0 V.
Nondestructive: ±15 V.
Minimum Input Signal Swing –
±250 mV (P6417, P6418, P6419).
±300 mV (P6434).
Input Signal Minimum Slew Rate –
200 mV/ns typical.

State Acquisition Characteristics

Maximum State Clock Rate – 235 MHz.
Maximum State Data Rate – 470 Mb/s.
State Record Length with Timestamps (half/full channels) – 4/2 Mb, 16/8 Mb, 64/32 Mb.
Setup and Hold Time Selection Range –
16 ns range that may be shifted towards the setup region by 0 ns [+8, –8] ns, 4 ns [+12, –4] ns or 8 ns [+16, 0] ns.
Setup-and-Hold Window –
All Channels: 1.5 ns typical.
Minimum Clock Pulse Width –
1.5 ns (P6434).
1.25 ns (P6417, P6418, P6419).
Demux Channel Selection –
Channels can be demultiplexed to other channels through user interface with 8-channel granularity.

Timing Acquisition Characteristics

MagniVu Timing Resolution –
125 ps (8 GHz).
Storage rate adjustable to 250 ps, 500 ps, 1 ns and 2 ns.
MagniVu Timing Record Length –
16 Kb per channel with adjustable trigger position.
Timing Resolution (quarter/half/full channels) –
500 ps/1 ns/2 ns to 50 ms.
Timing Record Length (quarter/half/full channels with timestamps and with or without transitional storage) –
8/4/2 Mb, 32/16/8 Mb, 128/64/32 Mb per channel.
Timing Record Length with Glitch Storage Enabled – Half of main record length.
Channel-to-Channel Skew – 1 ns (900 ps typical).
Minimum Recognizable Pulse/Glitch Width (single channel) –
1 ns (P6417, P6418, P6419), 1.25 ns (P6434).
Minimum Detectable Setup/Hold Violation –
250 ps.
Minimum Recognizable Multi-channel Trigger Event – Sample period + channel-to-channel skew.

Trigger Characteristics

Independent Trigger States – 16.
Maximum Independent If/Then Clauses per State – 16.
Maximum Number of Events per If/then Clause – 8.
Maximum Number of Actions per If/Then Clause – 8.
Maximum Number of Trigger Events –
18 (2 counter/timers plus any 16 other resources).
Number of Word Recognizers – 16.
Number of Transition Recognizers – 16.
Number of Range Recognizers – 4.
Number of Counter/Timers – 2.
Trigger Event Types –
Word, group, channel, transition, range, anything, counter value, timer value, signal, glitch, setup-and-hold violation, snapshot.
Trigger Action Types –
Trigger main, trigger MagniVu, store, don't store, start store, stop store, increment counter, decrement counter, reset counter, start timer, stop timer, reset timer, snapshot current sample, goto state, set/clear signal, do nothing.
Trigger Sequence Rate – DC to 500 MHz (2 ns).
Counter/Timer Range – 51 Bits each (>50 days at 2 ns).
Counter Rate – DC to 500 MHz (2 ns).
Timer Clock Rate – 500 MHz (2 ns).
Counter/Timer Latency – 2 ns.
Range Recognizers –
Double bounded (can be as wide as any group, must be grouped according to specified order of significance).
Setup-and-Hold Violation Recognizer Setup Time Range –
From 8 ns before to 7.5 ns after clock edge in 125 ps increments.
Setup-and-Hold Violation Recognizer Hold Time Range –
From 7.5 ns before to 8 ns after clock edge in 125 ps increments.
Trigger Position – Any data sample.
MagniVu Trigger Position –
MagniVu position can be set from 0% to 60% centered around the MagniVu trigger.
Storage Control (data qualification) –
Global (conditional), by state (start/stop), block, by trigger action or transitional. Force main prefill selection available.

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iView™ (Integrated View) Capability

Overview –
The iView capability seamlessly integrates and automatically time-correlates data from the logic analyzer and oscilloscope, so you can transfer analog waveforms from the oscilloscope to the logic analyzer display with the click of a mouse. View time-correlated analog and digital signals side-by-side and pinpoint the source of elusive glitches and other problems in moments.

Number of TDS Oscilloscopes That Can Be Connected to a TLA System – 1.

External Oscilloscopes Supported –
For a complete list of currently supported TDS oscilloscopes, please visit our website, http://www.tektronix.com/iview.

TLA Connections –
USB, Trigger In, Trigger Out, Clock Out.

TDS Connections –
GPIB, Trigger In, Trigger Out, Clock In (when available).

Setup –
iView external oscilloscope wizard automates setup.

Data Correlation –
After TDS oscilloscope acquisition is complete, data is automatically transferred to the TLA and time correlated with the TLA acquisition data.

Deskew –
TDS and TLA data is automatically deskewed and time correlated when using the iView external oscilloscope cable.

iView External Oscilloscope Cable Length – 2 m.

PC Characteristics

Operating System –
Microsoft Windows XP Professional with Multi-Lingual User Interface Pack.

Processor – Intel Celeron 2.93 GHz.

Chipset – Intel 945.

DRAM – 512 MB DDR2.

Sound – 16-Bit I/O and Mic-In port.

Hard Drive – 80 GB.

Optical Drive – Internal 24/10/24 CD-RW/DVD-RO.

Floppy Drive – Built-in 3.5 in. 1.44 MB drive.

Integral Controls

Front-Panel Display –
Size: 10.4 in. (26.4 cm) diagonal.
Type: Active-matrix color TFT LCD with backlight.
Resolution: 1024x768.
Colors: 256 K.

Simultaneous Display Capability –
The front-panel and secondary displays can be operated simultaneously using the same resolution. The secondary external display can be used simultaneously using an independent resolution.

Front-panel Controls –
Special function knobs for instrument control and mini-QWERTY keypad.

External Peripheral Interfaces

External Display Port Type –
Two female DB15 SVGA.

External Display Resolution –
Up to 1600x1200 non-interlaced at 16.8 M colors.

LAN Port Type – 1000Base-T, RJ-45.

External Keyboard Port Type – PS2 mini-DIN.

External Mouse Port Type – PS2 mini-DIN.

Parallel Interface Port Type – Female DB25.

Parallel Interface Modes – Centronics mode, EPP (Extended Parallel Port), ECP (Microsoft high-speed mode).

Serial Interface Port Type – Male DB9.

Audio Out Port Type – Stereo minijack.

Mic-In Port Type – Minijack.

USB Port – Four USB 2.0.

Symbolic Support

Number of Symbols/Ranges –
Unlimited (limited only by amount of virtual memory available on TLA).

Object File Formats Supported –
IEEE 695, OMF 51, OMF 86, OMF 166, OMF 286, OMF 386, COFF, Elf/Dwarf 1 and 2, Elf/Stabs, TSF (TSF is a generic ASCII file format documented in the TLA user manual). If a format is not listed, please contact your local Tektronix representative.

External Instrumentation Interfaces

System Trigger Output – 50 Ω BNC type connector.

System Trigger Input – 50 Ω BNC type connector.

External Signal Output – 50 Ω BNC type connector.

External Signal Input – 50 Ω BNC type connector.

Power

Voltage Range/Frequency –
90 to 240 VAC at 47 to 63 Hz.

Input Current – 5 A maximum at 90 VAC.

Power Consumption – 300 W maximum.

Physical Characteristics

TLA5000B

Dimensions	mm	in.
Height	285	11.2
Width	438	17.5
Depth	288	11.35
Weight	**kg**	**lb.**
Net (without probes)	12	26
Shipping (typical)	18.5	41

Environmental

Temperature –
Operating: +5 ºC to +50 ºC.
Nonoperating: –20 ºC to +60 ºC.

Humidity – 20% to 80%.
Operating: 20% to 80% relative humidity (29 ºC maximum wet bulb temperature).
Nonoperating: 8% to 80% (29 ºC maximum wet bulb temperature).

Altitude –
Operating: –1,000 ft. to 10,000 ft. (–305 meters to 3,050 meters).

Safety –
UL3111-1, CSA1010.1, EN61010-1, IEC61010-1.

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►Ordering Information

TLA5201B

34 Channel, 2 GHz Timing with 125 ps MagniVu™ Acquisition, 235 MHz State, 2 Mb Logic Analyzer.

TLA5202B

68 Channel, 2 GHz Timing with 125 ps MagniVu Acquisition, 235 MHz State, 2 Mb Logic Analyzer.

TLA5203B

102 Channel, 2 GHz Timing with 125 ps MagniVu Acquisition, 235 MHz State, 2 Mb Logic Analyzer.

TLA5204B

136 Channel, 2 GHz Timing with 125 ps MagniVu Acquisition, 235 MHz State, 2 Mb Logic Analyzer.

All Include: Mini Keyboard, USB (119-7083-00), Optical Wheel Mouse, USB (119-7054-xx), Front Panel Cover (200-4651-xx), Probe Retainer Bracket (407-4435-xx), Accessory Pouch (016-1935-xx), Mouse Pad (016-1524-xx), TLA5000B Series Product Software CD (063-3881-xx), TLA5000B Recovery Media (063-3884-xx), TLA Documentation CD (063-3671-xx), TLA5000B Installation Reference (071-2067-xx), TLA Quick Start User Manual (071-1575-xx), TLA5000B Installation Manual (071-2066-xx), Certificate of Traceable Calibration, Power Cord.

Note: Please specify power cord, language and service options when ordering.

Probes are sold separately.

Instrument options

Opt. 1C – Add iView™ external oscilloscope cable kit (012-1614-xx).

Opt. 8S – Increase to 8 Mb base record length per channel.

Opt. 9S – Increase to 32 Mb base record length per channel.

Recommended Accessories

Logic Analyzer Cart – LACART, K4000.

Logic Analyzer Cart Mounting Bracket Kit – (407-4996-xx).

TLA5000B Rackmount Kit – (016-1887-xx).

TLA5000B Wheeled Transport Case – (016-1937-xx).

TLA5000B Service Manual – (071-1305-xx).

Logic Analyzer Probe Selection Guidelines

There is a flexible choice of logic analyzer probes available for use with TLA5000B logic analyzers. Please see the logic analyzer probe data sheets for more information.

Service Options

Opt. C3 – Calibration Service 3 years.

Opt. C5 – Calibration Service 5 years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 years (with Opt. C3).

Opt. D5 – Calibration Data Report 5 years (with Opt. C5).

Opt. R3 – Repair Service 3 years.

Opt. R5 – Repair Service 5 years.

International Power Plugs

A0 – North America power (161-0104-00).

A1 – Universal Euro power (161-0104-06).

A2 – United Kingdom power (161-0104-07).

A3 – Australia power (161-0104-14).

A4 – 240 V, North America power (161-0104-08).

A5 – Switzerland power (161-0167-00).

A6 – Japan power (161-A005-00).

A10 – China power (161-0306-00).

A99 – No power cord or AC adapter.

Language Options

Opt. L0 – English manuals.

Opt. L5 – Japanese manuals.

Opt. L10 – Russian manuals.

Opt. L99 – No manuals.

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www.tektronix.com

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